Claims

1. Method for a digital transmission system, in which a first and second known symbol sequence ($\{s_1, s_2, \ldots, s_M\}$) are transmitted, the frequency offset (ΔF) of the transmission system is estimated by comparing a first section (${}^1f_M$) of the received signal (r) corresponding to the first symbol sequence with a second action (${}^2f_M$) of the received signal (r) corresponding to the second symbol sequence, and the square of the absolute value of a pulse response (h) of the transmission system is reduced in a time domain in order to lessen the influence of symbols (x) adjacent to the first or second known symbol sequence ($\{s_1, s_2, \ldots, s_M\}$) on the first and second section (${}^1f_M$, ${}^2f_M$), respectively, of the received signal (r).

2. Method according to Claim 1, in which the first and second symbol sequence ($\{s_1, s_2, \ldots, s_M\}$) are selected to be identical to one another.

3. Method according to Claim 1 or 2, in which the reduction in the square of the absolute value of the domain of the pulse response (h) of the transmission system is undertaken with the aid of a filter (14).

4. Method according to Claim 3, in which a pulse response (h) of the transmission system is estimated.

5. Method according to Claim 4, in which coefficients of the filter (14) are determined and/or adapted by means of the estimated pulse response (h).

6. Method according to Claim 6, in which the pulse response (h) is shortened.

7. Method according to Claims 1, 2, 4, 5, or 6, in which the energy of a domain of the pulse response (h) of the transmission system relative to the total energy of the pulse response (h) is reduced with the aid of an all-pass filter (14).

8. Method according to Claim 7, in which the all-pass filter (14) is adapted to achieve a low-phase pulse response of the transmission system.

9. Method according to Claim 8, in which one value (${}^1f_M$, ${}^2f_M$) of the first and second section of the received signal (r) is determined by sampling the received signal (r).

10. Method according to Claim 9, in which the angular difference ($\Delta\varphi$) in the complex plane between the first and second sample (${}^1f_M$, ${}^2f_M$) is used to estimate the frequency offset (ΔF).

11. Method according to Claim 10, in which several pairs of samples ($[{}^1f_1, {}^2f_1]$, $[{}^1f_2, {}^2f_2]$, ..., $[{}^1f_M, {}^2f_M]$) are averaged over the angular differences ($\Delta\varphi$).

12. Method according to Claim 11, in which the signals are transmitted in blocks, in particular in accordance with a GSM standard and/or EDGE standard.

13. Device (1) for a digital transmission system, comprising a transmitting device for transmitting a first and second known symbol sequence ($\{s_1, s_2, ..., s_M\}$), and means (15) for comparing a first section (${}^1f_M$) of the received signal (r) corresponding to the first symbol sequence with a second section (${}^2f_M$) of the received signal (r) corresponding to the second symbol sequence, as a result of which it is possible to estimate the frequency offset (ΔF) of the transmission system, characterized in that the device (1) comprises a first module (14) for reducing the square of the absolute value of a pulse response (h) of the transmission system in a time domain, it being possible by means of the reduction to lessen the influence of symbols (x) adjacent to the first or second known symbol sequence ($\{s_1, s_2, ..., s_M\}$) on the first and second section (${}^1f_M$, ${}^2f_M$), respectively, of the received signal (r).

14. Device (1) according to Claim 13, in which the first and second symbol sequence ($\{s_1, s_2, ..., s_M\}$) are identical to one another.

15. Device (1) according to Claim 13 or 14, in which the first module (14) comprises a filter.

16. Device (1) according to Claim 15, which comprises a second module (11) for estimating a pulse response ($\hat{h}$).

17. Device (1) according to Claim 16, which comprises a third module (12) for determining and/or adapting suitable coefficients of the filter (14).

18. Device (1) according to Claim 17, in which the pulse response (h) can be shortened by means of the first module (14).

19. Device (1) according to Claim 18, in which the first module (14) comprises an all-pass filter.

20. Device (1) according to Claim 19, in which the all-pass filter (14) can be adapted to achieve a low-phase pulse response of the transmission system.

21. Device (1) according to Claim 20, which comprises a sampling device for the received signal (r), with the aid of which one value (${}^1f_M$, ${}^2f_M$) of the first and second section of the received signal (r) can be sampled.

22. Device (1) according to Claim 21, which comprises means (16) for estimating the frequency offset (ΔF) from the angular difference ($\Delta\varphi$) in the complex plane between the first and second sample (${}^1f_M$, ${}^2f_M$).

23. Device (1) according to Claim 22, which comprises means for determining an average value of the angular differences ($\Delta\varphi$) of several pairs of samples ([${}^1f_1$, ${}^2f_1$], [${}^1f_2$, ${}^2f_2$], ..., [${}^1f_M$, ${}^2f_M$]).

24. Device (1) according to Claim 23, which is adapted for transmission in blocks, in particular in accordance with a GSM standard and/or EDGE standard.